

REMARKS

The Office Action dated November 24, 2008 has been fully considered by the Applicant. The Applicant gratefully acknowledges the Examiner's withdrawal of the § 112 rejection from the previous Office Action dated June 24, 2008, in light of the claim amendments dated August 14, 2008.

The rejection of Claims 1 through 6 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Maier (UK 1448158) in view of Cramwinckel (US 3,822,556) and further in view of Chen [Construction and Building Materials 16 (2002) 313-319], Jian-Shiuh Chen, Evaluation of internal resistance in hot mix asphalt concrete] is respectfully traversed. Likewise, the rejection of Claims 7-8 under 35 U.S.C. § 103(a) as being unpatentable over Maier in view of Cramwinckel further in view of Chen and still further in view of Malloy et al. (US 6,669,773) is respectfully traversed.

Independent Claim 1 requires the aggregate to be "comprised of about 80% by weight to about 100% by weight aggregate having a sieve size of less than about 4.75 mm." The Examiner notes in item 9 of the Office Action that "both Maier and Cramwinckel are silent as to the percentage of aggregate less than about 4.75 mm." In item 10, the Examiner cites Chen as teaching that a mixture with 50% aggregate under 4.75 mm "has increased tensile strength over the other samples and low void formation compared to other samples." The Examiner specifically references figures 2 and 3 of Chen in support of this statement. The Examiner then, in item 11, concludes that it would have been obvious to include 50% or more aggregate under about 4.75 mm in the mixture of Maier and Cramwinckel, and further to increase the aggregate less than about 4.75 mm to a range of about 60% to about 99.8% based on the data of figure 2 of Chen, which, the Examiner alleges, implies that an increase in the percentage would lead to higher tensile strengths and therefore stronger roads.

However, a thorough reading of Chen, with figure 2 considered in context, reveals that any conclusions drawn from the test results displayed in figure 2 are flawed and, in fact, Chen teaches away from concluding that increasing the percentage of aggregate results in stronger roads. Chen does find that Marshall stability and indirect tensile tests suggest that the stability and the indirect tensile strength increase when the ratio passing through the 4.75-mm sieve increases. Chen, p. 315-16. However, when

directly testing for internal resistance, Chen finds contrary results, indicating that the aggregate skeleton might start losing its internal resistance at approximately 45% passing through the 4.75-mm sieve. Chen, p. 318. Therefore, Chen concludes that the Marshall stability and indirect tensile tests may not be good indicators of measuring internal resistance, and that such tests are inadequate. Chen, p. 317, 319. In other words, Chen concludes that the results of the Marshall stability and indirect tensile tests, shown in Figures 1 and 2, are wrong. Thus, Chen actually teaches away from an assumption that increasing the aggregate passing through a 4.75 mm sieve above 45% produces improved results. It would not be obvious, based on Chen, to assume that increasing the aggregate passing through a 4.75 mm sieve to 80% or greater would produce better roads, as argued by the Examiner.

Based on the foregoing, while figure 2 does show increased indirect tensile strength with increased percentage of aggregate below 4.75 mm, Chen in fact teaches away from using greater than 45% aggregate in a hot mix asphalt mixture. Therefore, it would not be obvious, based on Chen, to use about 80% by weight to about 100% by weight aggregate having a sieve size of less than about 4.75 mm in the mixture of Claim 1. Chen thus fails to cure the deficiency of the combination of Maier and Cramwinckel. Consequently, Claim 1 is not obvious or unpatentable over Maier in view of Cramwinckel and further in view of Chen.

Claims 2-8 and 10 are dependent on Claim 1 and are believed patentable for the same reasons.

Furthermore, Claim 2 requires the asphalt binder of Claim 1 to be a polymer modified asphalt binder. The Examiner cites Maier as teaching a binder that contains asphalt and polyamine, and states that polyamine is a generic class of polymer. However, polyamine is not a class of polymer. This is evident from the respective definitions of polyamine and polymer. Polyamine is defined as "a compound characterized by more than one amino group." Merriam-Webster Online Dictionary (2009), retrieved February 4, 2009, from <http://www.merriam-webster.com/dictionary/polyamine>. It comes from the prefix "poly-" meaning "many," combined with "amine," meaning "any of a class of basic organic compounds derived from ammonia by replacement of hydrogen with one or more monovalent hydrocarbon radicals." *Id.* at <http://www.merriam-webster.com/dictionary/poly-> and <http://www.merriam-webster.com/amine>.

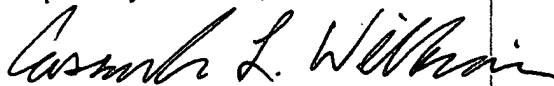
Polymer, on the other hand, is "a chemical compound or mixture of compounds formed by polymerization and consisting essentially of repeating structural units." *Id.* at <http://www.merriam-webster.com/dictionary/polymer>. It is from the Greek "polymerēs," which combines the prefix "poly-," again meaning "many," with "meros," which means "parts." *Id.* Thus, polyamine can only be a polymer if the polyamine is formed by polymerization and consists essentially of repeating structural units.

However, polyamine does not necessarily fit this definition. It is possible that a particular compound may be a polyamine and a polymer. However, it is also possible for a compound to be a polyamine but not a polymer, or to be a polymer but not a polyamine. Thus, polyamine is not a class of polymer. At best, the set of compounds that are polyamines may partly overlap the set of compounds that are polymers, but neither is fully inclusive of the other. In further support of this argument, please see the Declaration of Peter Schilling, submitted herewith. Mr. Schilling is an expert in the relevant art, and his Declaration establishes the fact that polyamine is not necessarily a polymer. Furthermore, even to the extent that such sets may theoretically overlap, polymers that are also polyamines are not known in the relevant art. This is also established by Mr. Schilling's Declaration. Thus, it would not be obvious to one skilled in the art to use a polymer modified asphalt binder based on Meier's use of polyamine in a binder.

Based on the foregoing, despite its use of a binder containing asphalt and polyamine, Meier does not suggest using a polymer modified asphalt binder, as required in Claim 2. Cramwinckel and Chen also fail to suggest a polymer modified asphalt binder. Therefore, Claim 2 is not obvious or unpatentable over Maier in view of Cramwinckel and further in view of Chen.

It is submitted that the application is now in condition for allowance and such action is earnestly solicited. The Commissioner is authorized to charge any additional fees associated with this application or credit any overpayment to Deposit Account No. 08-1500.

Respectfully submitted,



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